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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BEISNER, WILLIAM H	
ART UNIT	**PAPER NUMBER**
1744	

DATE MAILED: 08/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/801,077	TAYLOR ET AL.
	Examiner	Art Unit
	William H. Beisner	1744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 10* is/are rejected.

7)☒ Claim(s) *9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 20 July 2001 has been considered and made of record.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Heathcote et al.(US 2,856,148).

The reference of Heathcote et al. discloses a cartridge device that includes a body (1,2) having a first channel (5) and a second channel (6), a conical valve seat (7) positioned between the channels, and an elastic membrane (4) for establishing a circular seal with the valve seat to prevent the flow of fluid between the channels.

With respect to claims 3 and 5, channel (6) extends from the valve seat (7) and chamber (10) is provided in communication with a port in the valve seat (7) that is in communication with channel (6).

4. Claims 1, 3 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Say et al.(US 6,117,290).

The reference of Say et al. discloses a cartridge device that includes a body (3,4) having a first channel (not labeled, See Figs. 3 and 4) and a second channel (29), a conical valve seat (8) positioned between the channels, and an elastic membrane (28) for establishing a circular seal with the valve seat to prevent the flow of fluid between the channels.

With respect to claims 3 and 5, channel (29) extends from the valve seat (8) and chamber (not labeled, See Figs. 3 and 4) is provided in communication with a port in the valve seat (8) that is in communication with channel (29).

5. Claims 1, 3, 5, 7 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaczorowski et al.(EP 0 780 611).

The reference of Kaczorowski et al. discloses a cartridge device (50) that includes a body (31,32) having a first channel (36) and a second channel (35), a conical valve seat (39,49) positioned between the channels, and an elastic membrane (40) for establishing a circular seal with the valve seat to prevent the flow of fluid between the channels.

With respect to claims 3 and 5, channel (35) extends from the valve seat (49) and chamber (37) is provided in communication with a port in the valve seat (49) that is in communication with channel (35).

With respect to claim 6, the reference of Kaczorowski et al. also discloses a cartridge device (90) that includes a body (71,72); at least first and second channels (75,76) and a cavity

(79) separating the channels. The cavity is disclosed as a curved surface. The curved surface includes a first curved surface around the area of channel (75), a second curved surface around the area of channel (76) and a third curved surface between the first and second curved surfaces that define the unitary curved surface (79). The device includes an elastic membrane (80) that establishes a seal with respect to the curved surface near channels (75,76). As shown in Figure 11, the curvature of the actuator (81) with respect to the curvature of surface (79) results in the surface (79) being sealed near the channels (75, 76) while the membrane would not contact the middle area of surface (79) between the channels. Note whether or not the membrane contacts the entire surface of surface (79) not only depends on the shape of surface (79) but also on the shape of the actuator the contacts the membrane. For example, if surface (79) is spherical along its entire surface and a flat headed actuator is employed, the membrane would contact the surfaces of the surface (79) near the channels (75,76) but would not contact the middle surface of the surface (79) between the channels.

With respect to claim 7, the reference of Kaczorowski et al. discloses that the curved surfaces have a diameter (See column 7, lines 1-17). This implies that the surfaces are spherical since they have a diameter. As a result, the curved surface (79) would meet the claim language that the first and second surfaces are concentric spherical surfaces.

With respect to claim 8, the actuator (81, as shown in Figure 11) includes a spherical surface.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heathcote et al.(US 2,856,148) in view of Carlson et al.(US 4,846,440).

The reference of Heathcote et al. has been discussed above.

While the reference of Heathcote et al. discloses a valve actuator having a spherical surface for pressing the membrane against the valve seat (See element (16)), the reference is silent as to the use of an elastic body for forcing the valve actuator to press the membrane against the valve seat.

The reference of Carlson et al. discloses a valve device that includes an elastic membrane (52) that cooperates with a valve seat (42) to control the flow of fluid between a first channel (63) or chamber (64) and a second channel (44). The membrane is controlled by an actuator (54). The reference discloses that it is known in the art to force the membrane against the valve seat by providing the actuator (54) with an elastic body (56).

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the actuator of the primary reference with a spring/solenoid system disclosed by the reference of Carlson et al. for the known and expected result of providing a means known in the art for automating the control of an actuator with respect to an elastic membrane valve device. Automation of the valve device would be desirable so as to replace manual operation of the valve with automatic operation of the valve device.

10. Claims 2, 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaczorowski et al.(EP 0 780 611) in view of Carlson et al.(US 4,846,440).

The reference of Kaczorowski et al. has been discussed above.

While the reference of Kaczorowski et al. discloses a valve actuator having a spherical surface for pressing the membrane against the valve seat (See element (42) of Kaczorowski et

al.), the reference is silent as to the use of an elastic body for forcing the valve actuator to press the membrane against the valve seat.

The reference of Carlson et al. discloses a valve device that includes an elastic membrane (52) that cooperates with a valve seat (42) to control the flow of fluid between a first channel (63) or chamber (64) and a second channel (44). The membrane is controlled by an actuator (54). The reference discloses that it is known in the art to force the membrane against the valve seat by providing the actuator (54) with an elastic body (56).

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the actuator of the primary reference with a spring/solenoid system disclosed by the reference of Carlson et al. for the known and expected result of providing a means known in the art for automating the control of an actuator with respect to an elastic membrane valve device. Automation of the valve device would be desirable so as to replace manual operation of the valve with automatic operation of the valve device.

Allowable Subject Matter

11. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

While the closest prior art of Kaczorowski et al. discloses a valve device that includes a curved surface (79) cooperating with an actuator (81) to control the flow of fluid between

channels (75 and 76), the reference Kaczorowski et al. and any other prior art of record fails to teach or fairly suggest the claim limitation of claim 9 that requires that the first and second spherical surfaces have radius of curvatures that are equal to the sum of the radius of curvature of the spherical surface of the actuator plus the thickness of the membrane while still providing the gap with respect to the third surface of the cavity.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The references of Johnson et al.(US 6,056,269); Drexel (US 6,138,990) and Moles (US 6,293,012) are cited as prior art references that pertain to microfluidic systems that employ diaphragm valves.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Beisner whose telephone number is 703-308-4006. The examiner can normally be reached on Tues. to Fri. and alt. Mon. from 6:40am to 4:10pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Warden can be reached on 703-308-2920. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

William H. Beisner
Primary Examiner
Art Unit 1744

WHB
August 11, 2003